

## PATENT ABSTRACTS OF JAPAN

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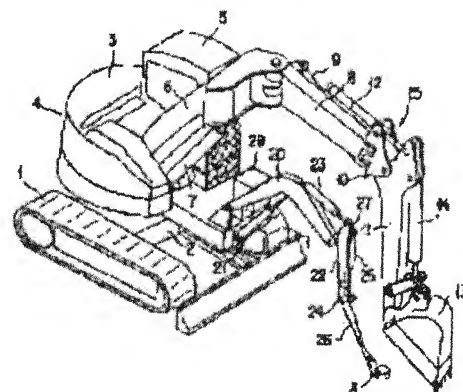
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## (54) WORKING MACHINE

## (57)Abstract:

PROBLEM TO BE SOLVED: To obtain a working machine that can safely eliminate a land mine efficiently.

SOLUTION: A bucket 13 is mounted to a car body 4 so that it can be rocked up and down freely by a first upper/lower rocking mechanism 15, a nozzle 26 is mounted to the car body 4 so that it can be rocked up and down freely by an upper/lower rocking mechanism 27, and air is sent to the nozzle 26 by an air supply device 28 being mounted to the car body 4 with pressure, thus emitting air to the ground surface with the nozzle 26 and blowing earth and sand on the ground surface and detecting underground mine and hence eliminating the mine by digging with a bucket 13.



## LEGAL STATUS

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CLAIMS

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[Claim(s)]

[Claim 1] The bucket attached in the car body (4) equipped with the transit object (1), and this car body (4) free [ vertical rocking ] at 1st surging motive guard (15) (13), It is the activity machine which equips the nozzle (26) attached in said car body (4) free [ vertical rocking ] at 2nd surging motive guard (27), and this nozzle (26) with the air supply equipment (28) which feeds air, and is characterized by said bucket (13) and nozzle (26) carrying out phase opposite.

[Claim 2] The bucket attached in the car body (4) equipped with the transit object (1), and this car body (4) free [ vertical rocking ] at 1st surging motive guard (15) (13), The nozzle attached in said car body (4) free [ vertical rocking ] at 2nd surging motive guard (27) (26), It is the activity machine which equips this nozzle (26) with the air supply equipment (28) which feeds air, and is characterized by said bucket (13) and nozzle (26) being movable in the location which carried out phase opposite, and the distant location.

[Claim 3] The bucket attached in the car body (4) equipped with the transit object (1), and this car body (4) free [ vertical rocking ] at 1st surging motive guard (15) (13), The activity machine characterized by constituting from air supply equipment (28) which feeds air at the nozzle (26) attached free [ migration into the other posture, and a bucket (13) and the posture which separated ], and this nozzle (26) in a bucket (13) at this 1st surging motive style (15).

[Claim 4] The activity machine characterized by constituting from air supply equipment (28) which feeds air for the car body (4) equipped with the transit object (1), the nozzle (26) attached in the bucket (13) attached in this car body (4) free [ vertical rocking ] at 1st surging motive guard (15), and this bucket (13), and this nozzle (26).

[Claim 5] Said nozzle (26) is claim 1 to which it has a nozzle body (30) and two or more kinds of jet sections (31), the nozzle body (30) is relieved of the one jet section (31), it is the configuration which can be attached, and the container (34) with which the one jet section (31) was put into the solid-state and the fluid is connected thru/or the activity machine of three publications.

[Claim 6] Claim 1 which attached in the point of a nozzle (26) the plate (35) of the vertical pair in which elastic deformation is possible, and (38) thru/or the activity machine of three publications.

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DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the activity machine used for the activity which removes a mine.

[0002]

[Description of the Prior Art] When a mine is explored with a metal finder to remove the mine in soil and there is a metal reaction in it, a rod-like metal is inserted at the include angle of less than 30 degrees to a horizontal plane, the side face of the mine in soil is touched with the location, and the location of a mine is checked. The mine is unearthed and removed by the scoop, a knife, a brush, etc. next.

[0003]

[Problem(s) to be Solved by the Invention] The metal object which removing the mine in soil as mentioned above required time amount, and detected with the metal finder is not a mine in many cases, and effectiveness is the bad removal approach very much. And since it carries out by human power, a mine may explode as incorrect \*\* and it is very dangerous.

[0004] Then, this invention solves the above-mentioned technical problem, and it aims at offering the activity machine from which it is efficient and the mine in soil can be removed safely.

[0005]

[Means for Solving the Problem and its Function and Effect] The car body 4 which the 1st invention equipped with the transit object 1, and the bucket 13 attached in this car body 4 free [ vertical rocking ] at 1st surging motive guard 15, Equipping the nozzle 26 attached in said car body 4 free [ vertical rocking ] at 2nd surging motive guard 27, and this nozzle 26 with the air supply equipment 28 which feeds air, said bucket 13 and nozzle 26 are an activity machine characterized by carrying out phase opposite.

[0006] According to the 1st invention, human being is not injured even if a mine explodes, since spurt out on the surface of the earth with a nozzle 26, blow away the earth and sand of surface of the earth, the mine in soil is exposed, a bucket 13 can unearth and remove the mine, and human being does not blow away direct earth and sand or does not unearth a mine. A mine is safely removable efficiently with this.

[0007] Moreover, a bucket 13 can receive the air which blew off from the nozzle 26, and the blown-away earth and sand, and it can prevent that air and earth and sand disperse around.

[0008] The car body 4 which the 2nd invention equipped with the transit object 1, and the bucket 13 attached in this car body 4 free [ vertical rocking ] at 1st surging motive guard 15, Equipping the nozzle 26 attached in said car body 4 free [ vertical rocking ] at 2nd surging motive guard 27, and this nozzle 26 with the air supply equipment 28 which feeds air, said bucket 13 and nozzle 26 are an activity machine characterized by being movable in the location which carried out phase opposite, and the distant location.

[0009] According to the 2nd invention, human being is not injured even if a mine explodes, since spurt out on the surface of the earth with a nozzle 26, blow away the earth and sand of surface of the earth, the mine in soil is exposed, a bucket 13 can unearth and remove the mine, and human being does not blow

away direct earth and sand or does not unearth a mine. A mine is safely removable efficiently with this.

[0010] Moreover, a bucket 13 can receive the air which blew off from the nozzle 26, and the blown-away earth and sand, and it can prevent that air and earth and sand disperse around.

[0011] Moreover, if it moves to the location which left the bucket 13 and the nozzle 26, a nozzle 26 will not become obstructive in case a mine is unearthed and carried out with a bucket 13.

[0012] The 3rd invention is the activity machine characterized at a bucket 13 at the car body 4 equipped with the transit object 1, the bucket 13 which attached in this car body 4 free [ vertical rocking ] at the 1st surging motive guard 15, and this 1st surging motive style 15 by to constitute from air-supply equipment 28 which feeds air at the other posture, a bucket 13, the nozzle 26 attached free [ migration into the posture which separated ], and this nozzle 26.

[0013] According to the 3rd invention, human being is not injured even if a mine explodes, since spurt out on the surface of the earth with a nozzle 26, blow away the earth and sand of surface of the earth, the mine in soil is exposed, a bucket 13 can unearth and remove the mine, and human being does not blow away direct earth and sand or does not unearth a mine. A mine is safely removable efficiently with this.

[0014] Moreover, a bucket 13 can receive the air which blew off from the nozzle 26, and the blown-away earth and sand, and it can prevent that air and earth and sand disperse around.

[0015] Moreover, a nozzle 26 does not become obstructive when unearthing and carrying out a mine with the posture which is separated from a bucket 13 in a nozzle 26, then a bucket 13.

[0016] The 4th invention is an activity machine characterized by constituting from air supply equipment 28 which feeds air for the car body 4 equipped with the transit object 1, the bucket 13 attached in this car body 4 free [ vertical rocking ] at 1st surging motive guard 15, the nozzle 26 attached in this bucket 13, and this nozzle 26.

[0017] According to the 4th invention, human being is not injured even if a mine explodes, since spurt out on the surface of the earth with a nozzle 26, blow away the earth and sand of surface of the earth, the mine in soil is exposed, a bucket 13 can unearth and remove the mine, and human being does not blow away direct earth and sand or does not unearth a mine. A mine is safely removable efficiently with this.

[0018] In the 1st thru/or the 3rd invention, said nozzle 26 is equipped with a nozzle body 30 and two or more kinds of jet sections 31, the 5th invention relieves the nozzle body 30 of the one jet section 31, it is the configuration which can be attached, and the one jet section 31 is an activity machine to which the container 34 put into the solid-state and the fluid is connected.

[0019] According to the 5th invention, it can consider as the nozzle 26 equipped with the jet section 31 of arbitration according to the configuration of the ground etc. Moreover, since a solid-state and a fluid will spout with air if a mine is exposed and it will exchange for the jet section 31 which connected the container 34, it is also possible to explode a mine.

[0020] The 6th invention is the activity machine which attached in the point of a nozzle 26 the plates 35 and 38 of the vertical pair in which elastic deformation is possible in the 1st thru/or the 3rd invention.

[0021] According to the 6th invention, since plates 35 and 38 vibrate with the air spouted from a nozzle 26, surface of the earth can be hit and crushed on the plates 34 and 38. By this, the earth and sand of hard surface of the earth can be crushed, and it can blow away with air.

[0022]

[Embodiment of the Invention] It has considered as the car body 4 with the lower car body 2 equipped with the transit object 1 on either side, and the up car body 3 attached in this lower car body 2 free [ revolution ]. While having attached the driver's cabin 5 in the up car body 3, the 1st boom 6 is attached free [ vertical rocking ] by the 1st boom cylinder 7. The arm 11 is attached in the bracket 10 which has attached the 2nd boom 8 in this 1st boom 6 free [ right-and-left rocking ] in the cylinder 9, and was attached in this 2nd boom 8 free [ vertical rocking ] with the arm hydraulic cylinder 12, and the bucket 13 is attached in that arm 11 free [ a vertical neck swing ] by the bucket hydraulic cylinder 14. That is, the bucket 13 is attached free [ vertical rocking ] at 1st surging motive guard 15.

[0023] The auxiliary boom 20 is attached in said up car body 3 free [ vertical rocking ] by the auxiliary boom cylinder 21, and the auxiliary arm 22 is attached in this auxiliary boom 20 free [ vertical rocking ] with the auxiliary arm hydraulic cylinder 23. The nozzle attachment object 24 is attached in this

auxiliary arm 22 free [ vertical rocking ] in the cylinder 25, and the nozzle is attached in this nozzle attachment object 24. That is, the nozzle 26 is attached free [ vertical rocking ] at 2nd surging motive guard 27. From air supply equipment 28, air is fed by said nozzle 26 and it spouts for it.

[0024] Next, actuation is explained. As shown in drawing 1, rather than a bucket 13, a nozzle 26 is located in a car-body side, air is blown off from a nozzle 26 on the ground, and earth and sand are blown away. These earth and sand that blew away collide with a bucket 13, and do not disperse around.

[0025] The mine A in soil is exposed to surface of the earth by performing the above-mentioned actuation, and a bucket 13 digs up and removes the exposed mine A.

[0026] Next, other gestalten of a nozzle 26 are explained. As shown in drawing 2, while considering as a nozzle 26 in a nozzle body 30 and the jet section 31 and forming projection 32 in a nozzle body 30, the slot 33 on the ancyloid is formed in the base of the jet section 31, and the attachment and detachment of the jet section 31 to a nozzle body 30 are enabled by engaging and releasing projection 32 in this slot 33.

[0027] As the jet section 31, it is what was extended in the trumpet mold, a wide mouth narrow-width thing, the thing which connected the container 34 into which what cut the point aslant, a solid-state, or a liquid is put, and according to an application, jet opening 31a relieves a nozzle body 30 of the one jet section 31, and attaches it. In addition, if the jet section 31 which connected the container 34 is attached, since the solid-state in a container 34 and a liquid will spout with air, it is also possible to explode the exposed mine A.

[0028] As shown in drawing 3 and drawing 4, the plate 35 which became sheet metal-like with rubber or cloth is attached in the point upper and lower sides of a nozzle 26, respectively. The die length of this plate 35 is about 5 to 10 times of width of face.

[0029] If it does in this way, since a plate 35 will vibrate in the vertical direction with the air which blew off from the nozzle 26, the earth and sand of the hard ground can be cracked and blown away.

[0030] As shown in drawing 5 and drawing 6, two or more jet sections 31 are attached in a nozzle body 30, and let full [ of the jet section 31 ] be the width of face of a bucket 13, and abbreviation identitas. Moreover, it counters with each jet section 31, the bulb 37 which operates with a stretching screw 36 is formed in a nozzle body 30, respectively, and it enables it to have adjusted the amount of the air which blows off from each jet section 31.

[0031] If it does in this way, the earth and sand of the same width of face as the width of face of a bucket 13 can be blown away at once.

[0032] As shown in drawing 7 and drawing 8, the plate 38 made of rubber of each jet section 31 is attached up and down, respectively, and the weight 39 which has irregularity in the point of each of this plate 38 on a front face is attached with a chain 40.

[0033] If it does in this way, since a plate 38 will vibrate with the air which blew off and weight 39 will move in the direction of arbitration violently, the hard ground can be cracked and it can blow away in Ayr.

[0034] Next, the gestalt of operation of the 2nd of this invention is explained. As shown in drawing 9, the up car body 3 and a swivel base 51 are attached in the lower car body 2 independently possible [ revolution ] with the duplex revolving circle 50. A bucket 13 is attached in the up car body 3 free [ vertical rocking ] at 1st surging motive guard 15. A nozzle 26 is attached in a swivel base 51 free [ vertical rocking ] at 2nd surging motive guard 27, and air supply equipment 28 is attached in this swivel base 51.

[0035] Next, the gestalt of operation of the 3rd of this invention is explained. As shown in drawing 10, a bucket 13 is attached in the up car body 3 free [ vertical rocking ] at 1st surging motive guard 15. While attaching a nozzle 26 in the blade 52 attached free [ vertical rocking ] in the cylinder which is not illustrated into the lower car body 2 free [ vertical rocking ] at 2nd surging motive guard 27, air supply equipment 28 is attached.

[0036] Next, the gestalt of operation of the 4th of this invention is explained. As shown in drawing 11, a bucket 13 is attached in the up car body 3 free [ vertical rocking ] at 1st surging motive guard 15. While attaching a nozzle 26 in the bracket 53 attached in the lower car body 2 free [ vertical rocking ] at 2nd

surging motive guard 27, air supply equipment 28 is attached.

[0037] According to the gestalt of the above-mentioned 2nd, the 3rd, and the 4th operation, a nozzle 26 can be located behind a bucket 13, the earth and sand of surface of the earth can be blown away, and the earth and sand of surface of the earth can be blown away by nozzle 26 independent one.

[0038] Next, the gestalt of operation of the 5th of this invention is explained. As shown in drawing 12, a bucket 13 is attached in the up car body 3 free [ vertical rocking ] at 1st surging motive guard 15. The air supply equipment 28 which attached in the tip approach of this arm 11 for the nozzle 26, enabling free vertical rocking, and was attached in the boom 6 is attached, and air is supplied to a nozzle 26 with a hose 60.

[0039] As shown in drawing 13, a barrel 62 is fitted in the hole 61 of an arm 11, enabling free rotation, and a nozzle 26 is attached in the end section of this barrel 62 in one. The other end of said barrel 62 is inserted in the fixed barrel 63 which fixed on the arm 11, enabling free rotation, and a barrel 62 is rotated with the hydraulic motor 64 attached in the fixed barrel 63. A hose 60 is connected to the fixed barrel 63, and air is fed from the opening 65 of a barrel 62.

[0040] The earth and sand of surface of the earth can be blown away by rocking an arm 11 up and making a nozzle 26 slanting to the ground at a bucket 13 as the other posture. A nozzle 26 is dug up as parallel to an arm 11 with a bucket 13, the posture which separated, then a bucket 13, and it can work.

[0041] Next, the gestalt of operation of the 6th of this invention is explained. As shown in drawing 14, a bucket 13 is attached in the up car body 3 free [ vertical rocking ] at 1st surging motive guard 15. In this bucket 13, a nozzle 26 is attached, as shown in drawing 15, air supply equipment 28 is attached in the 1st boom 6, and air is fed for a nozzle 26 with a hose 60.

[0042] In addition, the nozzle 26 used for the gestalt of the 2nd thru/or the 5th operation can use the nozzle 26 shown in the gestalt of each above-mentioned operation.

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TECHNICAL FIELD

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[Field of the Invention] This invention relates to the activity machine used for the activity which removes a mine.

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PRIOR ART

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[Description of the Prior Art] When a mine is explored with a metal finder to remove the mine in soil and there is a metal reaction in it, a rod-like metal is inserted at the include angle of less than 30 degrees to a horizontal plane, the side face of the mine in soil is touched with the location, and the location of a mine is checked. The mine is unearthed and removed by the scoop, a knife, a brush, etc. next.

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EFFECT OF THE INVENTION

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[Means for Solving the Problem and its Function and Effect] The car body 4 which the 1st invention equipped with the transit object 1, and the bucket 13 attached in this car body 4 free [ vertical rocking ] at 1st surging motive guard 15, Equipping the nozzle 26 attached in said car body 4 free [ vertical rocking ] at 2nd surging motive guard 27, and this nozzle 26 with the air supply equipment 28 which feeds air, said bucket 13 and nozzle 26 are an activity machine characterized by carrying out phase opposite.

[0006] According to the 1st invention, human being is not injured even if a mine explodes, since spurt out on the surface of the earth with a nozzle 26, blow away the earth and sand of surface of the earth, the mine in soil is exposed, a bucket 13 can unearth and remove the mine, and human being does not blow away direct earth and sand or does not unearth a mine. A mine is safely removable efficiently with this.

[0007] Moreover, a bucket 13 can receive the air which blew off from the nozzle 26, and the blown-away earth and sand, and it can prevent that air and earth and sand disperse around.

[0008] The car body 4 which the 2nd invention equipped with the transit object 1, and the bucket 13 attached in this car body 4 free [ vertical rocking ] at 1st surging motive guard 15, Equipping the nozzle 26 attached in said car body 4 free [ vertical rocking ] at 2nd surging motive guard 27, and this nozzle 26 with the air supply equipment 28 which feeds air, said bucket 13 and nozzle 26 are an activity machine characterized by being movable in the location which carried out phase opposite, and the distant location.

[0009] According to the 2nd invention, human being is not injured even if a mine explodes, since spurt out on the surface of the earth with a nozzle 26, blow away the earth and sand of surface of the earth, the mine in soil is exposed, a bucket 13 can unearth and remove the mine, and human being does not blow away direct earth and sand or does not unearth a mine. A mine is safely removable efficiently with this.

[0010] Moreover, a bucket 13 can receive the air which blew off from the nozzle 26, and the blown-away earth and sand, and it can prevent that air and earth and sand disperse around.

[0011] Moreover, if it moves to the location which left the bucket 13 and the nozzle 26, a nozzle 26 will not become obstructive in case a mine is unearthed and carried out with a bucket 13.

[0012] The 3rd invention is the activity machine characterized at a bucket 13 at the car body 4 equipped with the transit object 1, the bucket 13 which attached in this car body 4 free [ vertical rocking ] at the 1st surging motive guard 15, and this 1st surging motive style 15 by to constitute from air-supply equipment 28 which feeds air at the other posture, a bucket 13, the nozzle 26 attached free [ migration into the posture which separated ], and this nozzle 26.

[0013] According to the 3rd invention, human being is not injured even if a mine explodes, since spurt out on the surface of the earth with a nozzle 26, blow away the earth and sand of surface of the earth, the mine in soil is exposed, a bucket 13 can unearth and remove the mine, and human being does not blow away direct earth and sand or does not unearth a mine. A mine is safely removable efficiently with this.

[0014] Moreover, a bucket 13 can receive the air which blew off from the nozzle 26, and the blown-away earth and sand, and it can prevent that air and earth and sand disperse around.

[0015] Moreover, a nozzle 26 does not become obstructive when unearthing and carrying out a mine

- with the posture which is separated from a bucket 13 in a nozzle 26, then a bucket 13.
- [0016] The 4th invention is an activity machine characterized by constituting from air supply equipment 28 which feeds air for the car body 4 equipped with the transit object 1, the bucket 13 attached in this car body 4 free [ vertical rocking ] at 1st surging motive guard 15, the nozzle 26 attached in this bucket 13, and this nozzle 26.
- [0017] According to the 4th invention, human being is not injured even if a mine explodes, since spurt out on the surface of the earth with a nozzle 26, blow away the earth and sand of surface of the earth, the mine in soil is exposed, a bucket 13 can unearth and remove the mine, and human being does not blow away direct earth and sand or does not unearth a mine. A mine is safely removable efficiently with this.
- [0018] In the 1st thru/or the 3rd invention, said nozzle 26 is equipped with a nozzle body 30 and two or more kinds of jet sections 31, the 5th invention relieves the nozzle body 30 of the one jet section 31, it is the configuration which can be attached, and the one jet section 31 is an activity machine to which the container 34 put into the solid-state and the fluid is connected.
- [0019] According to the 5th invention, it can consider as the nozzle 26 equipped with the jet section 31 of arbitration according to the configuration of the ground etc. Moreover, since a solid-state and a fluid will spout with air if a mine is exposed and it will exchange for the jet section 31 which connected the container 34, it is also possible to explode a mine.
- [0020] The 6th invention is the activity machine which attached in the point of a nozzle 26 the plates 35 and 38 of the vertical pair in which elastic deformation is possible in the 1st thru/or the 3rd invention.
- [0021] According to the 6th invention, since plates 35 and 38 vibrate with the air spouted from a nozzle 26, surface of the earth can be hit and crushed on the plates 34 and 38. By this, the earth and sand of hard surface of the earth can be crushed, and it can blow away with air.
- [0022]
- [Embodiment of the Invention] It has considered as the car body 4 with the lower car body 2 equipped with the transit object 1 on either side, and the up car body 3 attached in this lower car body 2 free [ revolution ]. While having attached the driver's cabin 5 in the up car body 3, the 1st boom 6 is attached free [ vertical rocking ] by the 1st boom cylinder 7. The arm 11 is attached in the bracket 10 which has attached the 2nd boom 8 in this 1st boom 6 free [ right-and-left rocking ] in the cylinder 9, and was attached in this 2nd boom 8 free [ vertical rocking ] with the arm hydraulic cylinder 12, and the bucket 13 is attached in that arm 11 free [ a vertical neck swing ] by the bucket hydraulic cylinder 14. That is, the bucket 13 is attached free [ vertical rocking ] at 1st surging motive guard 15.
- [0023] The auxiliary boom 20 is attached in said up car body 3 free [ vertical rocking ] by the auxiliary boom cylinder 21, and the auxiliary arm 22 is attached in this auxiliary boom 20 free [ vertical rocking ] with the auxiliary arm hydraulic cylinder 23. The nozzle attachment object 24 is attached in this auxiliary arm 22 free [ vertical rocking ] in the cylinder 25, and the nozzle is attached in this nozzle attachment object 24. That is, the nozzle 26 is attached free [ vertical rocking ] at 2nd surging motive guard 27. From air supply equipment 28, air is fed by said nozzle 26 and it spouts for it.
- [0024] Next, actuation is explained. As shown in drawing 1, rather than a bucket 13, a nozzle 26 is located in a car-body side, air is blown off from a nozzle 26 on the ground, and earth and sand are blown away. These earth and sand that blew away collide with a bucket 13, and do not disperse around.
- [0025] The mine A in soil is exposed to surface of the earth by performing the above-mentioned actuation, and a bucket 13 digs up and removes the exposed mine A.
- [0026] Next, other gestalten of a nozzle 26 are explained. As shown in drawing 2, while considering as a nozzle 26 in a nozzle body 30 and the jet section 31 and forming projection 32 in a nozzle body 30, the slot 33 on the ancyloid is formed in the base of the jet section 31, and the attachment and detachment of the jet section 31 to a nozzle body 30 are enabled by engaging and releasing projection 32 in this slot 33.
- [0027] As the jet section 31, it is what was extended in the trumpet mold, a wide mouth narrow-width thing, the thing which connected the container 34 into which what cut the point aslant, a solid-state, or a liquid is put, and according to an application, jet opening 31a relieves a nozzle body 30 of the one jet section 31, and attaches it. In addition, if the jet section 31 which connected the container 34 is attached,

since the solid-state in a container 34 and a liquid will spout with air, it is also possible to explode the exposed mine A.

[0028] As shown in drawing 3 and drawing 4, the plate 35 which became sheet metal-like with rubber or cloth is attached in the point upper and lower sides of a nozzle 26, respectively. The die length of this plate 35 is about 5 to 10 times of width of face.

[0029] If it does in this way, since a plate 35 will vibrate in the vertical direction with the air which blew off from the nozzle 26, the earth and sand of the hard ground can be cracked and blown away.

[0030] As shown in drawing 5 and drawing 6, two or more jet sections 31 are attached in a nozzle body 30, and let full [ of the jet section 31 ] be the width of face of a bucket 13, and abbreviation identitas. Moreover, it counters with each jet section 31, the bulb 37 which operates with a stretching screw 36 is formed in a nozzle body 30, respectively, and it enables it to have adjusted the amount of the air which blows off from each jet section 31.

[0031] If it does in this way, the earth and sand of the same width of face as the width of face of a bucket 13 can be blown away at once.

[0032] As shown in drawing 7 and drawing 8, the plate 38 made of rubber of each jet section 31 is attached up and down, respectively, and the weight 39 which has irregularity in the point of each of this plate 38 on a front face is attached with a chain 40.

[0033] If it does in this way, since a plate 38 will vibrate with the air which blew off and weight 39 will move in the direction of arbitration violently, the hard ground can be cracked and it can blow away in Ayr.

[0034] Next, the gestalt of operation of the 2nd of this invention is explained. As shown in drawing 9, the up car body 3 and a swivel base 51 are attached in the lower car body 2 independently possible [ revolution ] with the duplex revolving circle 50. A bucket 13 is attached in the up car body 3 free [ vertical rocking ] at 1st surging motive guard 15. A nozzle 26 is attached in a swivel base 51 free [ vertical rocking ] at 2nd surging motive guard 27, and air supply equipment 28 is attached in this swivel base 51.

[0035] Next, the gestalt of operation of the 3rd of this invention is explained. As shown in drawing 10, a bucket 13 is attached in the up car body 3 free [ vertical rocking ] at 1st surging motive guard 15. While attaching a nozzle 26 in the blade 52 attached free [ vertical rocking ] in the cylinder which is not illustrated into the lower car body 2 free [ vertical rocking ] at 2nd surging motive guard 27, air supply equipment 28 is attached.

[0036] Next, the gestalt of operation of the 4th of this invention is explained. As shown in drawing 11, a bucket 13 is attached in the up car body 3 free [ vertical rocking ] at 1st surging motive guard 15. While attaching a nozzle 26 in the bracket 53 attached in the lower car body 2 free [ vertical rocking ] at 2nd surging motive guard 27, air supply equipment 28 is attached.

[0037] According to the gestalt of the above-mentioned 2nd, the 3rd, and the 4th operation, a nozzle 26 can be located behind a bucket 13, the earth and sand of surface of the earth can be blown away, and the earth and sand of surface of the earth can be blown away by nozzle 26 independent one.

[0038] Next, the gestalt of operation of the 5th of this invention is explained. As shown in drawing 12, a bucket 13 is attached in the up car body 3 free [ vertical rocking ] at 1st surging motive guard 15. The air supply equipment 28 which attached in the tip approach of this arm 11 for the nozzle 26, enabling free vertical rocking, and was attached in the boom 6 is attached, and air is supplied to a nozzle 26 with a hose 60.

[0039] As shown in drawing 13, a barrel 62 is fitted in the hole 61 of an arm 11, enabling free rotation, and a nozzle 26 is attached in the end section of this barrel 62 in one. The other end of said barrel 62 is inserted in the fixed barrel 63 which fixed on the arm 11, enabling free rotation, and a barrel 62 is rotated with the hydraulic motor 64 attached in the fixed barrel 63. A hose 60 is connected to the fixed barrel 63, and air is fed from the opening 65 of a barrel 62.

[0040] The earth and sand of surface of the earth can be blown away by rocking an arm 11 up and making a nozzle 26 slanting to the ground at a bucket 13 as the other posture. A nozzle 26 is dug up as parallel to an arm 11 with a bucket 13, the posture which separated, then a bucket 13, and it can work.

[0041] Next, the gestalt of operation of the 6th of this invention is explained. As shown in drawing 14 , a bucket 13 is attached in the up car body 3 free [ vertical rocking ] at 1st surging motive guard 15. In this bucket 13, a nozzle 26 is attached, as shown in drawing 15 , air supply equipment 28 is attached in the 1st boom 6, and air is fed for a nozzle 26 with a hose 60.

[0042] In addition, the nozzle 26 used for the gestalt of the 2nd thru/or the 5th operation can use the nozzle 26 shown in the gestalt of each above-mentioned operation.

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[Translation done.]

\* NOTICES \*

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TECHNICAL PROBLEM

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[Problem(s) to be Solved by the Invention] The metal object which removing the mine in soil as mentioned above required time amount, and detected with the metal finder is not a mine in many cases, and effectiveness is the bad removal approach very much. And since it carries out by human power, a mine may explode as incorrect \*\* and it is very dangerous.  
[0004] Then, this invention solves the above-mentioned technical problem, and it aims at offering the activity machine from which it is efficient and the mine in soil can be removed safely.

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[Translation done.]

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DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

- [Drawing 1] It is the perspective view showing the gestalt of operation of the 1st of this invention.  
[Drawing 2] It is the decomposition perspective view showing other gestalten of a nozzle.  
[Drawing 3] It is the perspective view showing other gestalten of a nozzle.  
[Drawing 4] It is an explanatory view of operation.  
[Drawing 5] It is the perspective view showing other gestalten and buckets of a nozzle.  
[Drawing 6] It is the sectional view for a controller of the jet air content from a nozzle.  
[Drawing 7] It is the perspective view showing other gestalten of a nozzle.  
[Drawing 8] It is an explanatory view of operation.  
[Drawing 9] It is the side elevation showing the gestalt of operation of the 2nd of this invention.  
[Drawing 10] It is the side elevation showing the gestalt of operation of the 3rd of this invention.  
[Drawing 11] It is the side elevation showing the gestalt of operation of the 4th of this invention.  
[Drawing 12] It is the side elevation showing the gestalt of operation of the 5th of this invention.  
[Drawing 13] It is the sectional view of a nozzle junction.  
[Drawing 14] It is the perspective view showing the gestalt of operation of the 6th of this invention.  
[Drawing 15] It is the perspective view of a bucket.

[Description of Notations]

- 1 -- Transit object
- 2 -- Lower car body
- 3 -- Up car body
- 4 -- Car body
- 13 -- Bucket
- 15 -- 1st surging motive style
- 26 -- Nozzle
- 27 -- 2nd surging motive style
- 28 -- Air supply equipment
- 30 -- Nozzle body
- 31 -- Jet section
- 34 -- Container
- 35 -- Plate
- 36 -- Stretching screw
- 37 -- Bulb
- 38 -- Plate
- 39 -- Weight
- 40 -- Chain
- 50 -- Duplex revolving circle
- 51 -- Swivel base
- 52 -- Blade

53 -- Bracket  
60 -- Hose  
62 -- Barrel  
63 -- Fixed barrel  
64 -- Hydraulic motor

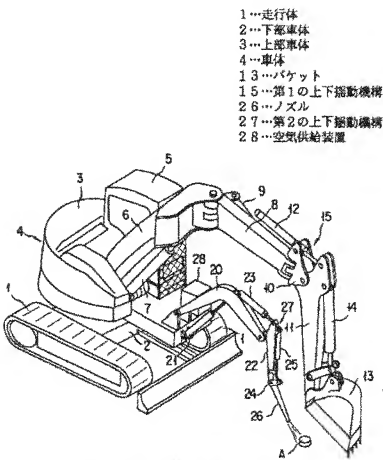
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(54)【発明の名称】 作業機械

(57)【要約】  
【課題】 地雷を効率良く安全に除去できる作業機械とする。  
【解決手段】 車体4にバケット13を第1の上下揺動機構15で上下揺動自在に取付け、車体4にノズル26を第2の上下揺動機構27で上下揺動自在に取付け、車体4に取付けた空気供給装置28でノズル26に空気を圧送する。これによって、ノズル26で空気を地表に噴出して地表の土砂を吹き飛ばして地中の地雷を探知し、バケット13で掘り出して除去できる。



本発明の第1の実施の形態を示す斜視図

## 【特許請求の範囲】

【請求項1】 走行体(1)を備えた車体(4)と、この車体(4)に第1の上下揺動機構(15)で上下揺動自在に取付けたバケット(13)と、前記車体(4)に第2の上下揺動機構(27)で上下揺動自在に取付けたノズル(26)と、このノズル(26)に空気を圧送する空気供給装置(28)を備え、前記バケット(13)とノズル(26)は相対向していることを特徴とする作業機械。

【請求項2】 走行体(1)を備えた車体(4)と、この車体(4)に第1の上下揺動機構(15)で上下揺動自在に取付けたバケット(13)と、前記車体(4)に第2の上下揺動機構(27)で上下揺動自在に取付けたノズル(26)と、このノズル(26)に空気を圧送する空気供給装置(28)を備え、前記バケット(13)とノズル(26)は相対向した位置と離れた位置に移動可能であることを特徴とする作業機械。

【請求項3】 走行体(1)を備えた車体(4)と、この車体(4)に第1の上下揺動機構(15)で上下揺動自在に取付けたバケット(13)と、この第1の上下揺動機構(15)にバケット(13)に向う姿勢とバケット(13)と離れた姿勢に移動自在に取付けたノズル(26)と、このノズル(26)に空気を圧送する空気供給装置(28)で構成したことを特徴とする作業機械。

【請求項4】 走行体(1)を備えた車体(4)と、この車体(4)に第1の上下揺動機構(15)で上下揺動自在に取付けたバケット(13)と、このバケット(13)に取付けたノズル(26)と、このノズル(26)に空気を圧送する空気供給装置(28)で構成したことを特徴とする作業機械。

【請求項5】 前記ノズル(26)は、ノズル本体(30)と複数種類の噴出部(31)を備え、そのノズル本体(30)に1つの噴出部(31)を交替して取付け可能な形状で、1つの噴出部(31)は固体、流体が入れられた容器(34)が接続してある請求項1ないし3記載の作業機械。

【請求項6】 ノズル(26)の先端部に弾性変形可能な上下一対のプレート(35)、(38)を取付けた請求項1ないし3記載の作業機械。

## 【発明の詳細な説明】

【0001】

【発明の属する技術分野】 本発明は、地雷を除去する作業に用いる作業機械に関する。

【0002】

【従来の技術】 土中にある地雷を除去するには金属探知機で地雷を探り、金属反応がある場合、その場所を水平面に対し30°以内の角度で棒状の金属を差し込み、土中にある地雷の側面に触れて地雷の位置を確認する。こ

の後にスコップやナイフ、ハケ等で地雷を掘り出して除去している。

【0003】

【発明が解決しようとする課題】 前述のようにして土中の地雷を除去するのは時間がかかり、金属探知機で探知した金属物が地雷でないことが多く、大変効率が悪い除去方法である。しかも、人力で行なうので誤まって地雷が爆発することがあり大変危険である。

【0004】 そこで、本発明は前述の課題を解決して土中の地雷を効率良く、安全に除去できる作業機械を提供することを目的とする。

【0005】

【課題を解決するための手段及び作用効果】 第1の発明は、走行体1を備えた車体4と、この車体4に第1の上下揺動機構15で上下揺動自在に取付けたバケット13と、前記車体4に第2の上下揺動機構27で上下揺動自在に取付けたノズル26と、このノズル26に空気を圧送する空気供給装置28を備え、前記バケット13とノズル26は相対向していることを特徴とする作業機械である。

【0006】 第1の発明によれば、ノズル26で地表に空気を噴きつけて地表の土砂を吹き飛ばして土中の地雷を露出させ、その地雷をバケット13で掘り出して除去できるし、人間が直接土砂を吹き飛ばしたり、地雷を掘り出したりしないので地雷が爆発しても人間がけがをすることがない。これによって、地雷を効率良く、しかも安全に除去できる。

【0007】 また、ノズル26から吹き出した空気及び吹き飛ばされた土砂をバケット13で受けることができ、空気や土砂が周囲に飛散することを防止できる。

【0008】 第2の発明は、走行体1を備えた車体4と、この車体4に第1の上下揺動機構15で上下揺動自在に取付けたバケット13と、前記車体4に第2の上下揺動機構27で上下揺動自在に取付けたノズル26と、このノズル26に空気を圧送する空気供給装置28を備え、前記バケット13とノズル26は相対向した位置と離れた位置に移動可能であることを特徴とする作業機械である。

【0009】 第2の発明によれば、ノズル26で地表に空気を噴きつけて地表の土砂を吹き飛ばして土中の地雷を露出させ、その地雷をバケット13で掘り出して除去できるし、人間が直接土砂を吹き飛ばしたり、地雷を掘り出したりしないので地雷が爆発しても人間がけがをすることがない。これによって、地雷を効率良く、しかも安全に除去できる。

【0010】 また、ノズル26から吹き出した空気及び吹き飛ばされた土砂をバケット13で受けることができ、空気や土砂が周囲に飛散することを防止できる。

【0011】 また、バケット13とノズル26を離れた位置に移動すれば、バケット13で地雷を掘り出す

際にノズル26が邪魔にならない。

【0012】第3の発明は、走行体1を備えた車体4と、この車体4に第1の上下揺動機構15で上下揺動自在に取付けたバケット13と、この第1の上下揺動機構15にバケット13に向う姿勢とバケット13と離れた姿勢に移動自在に取付けたノズル26と、このノズル26に空気を圧送する空気供給装置28で構成したことを特徴とする作業機械である。

【0013】第3の発明によれば、ノズル26で地表に空気を噴きつけて地表の土砂を吹き飛ばして土中の地雷を露出させ、その地雷をバケット13で掘り出して除去できるし、人間が直接土砂を吹き飛ばしたり、地雷を掘り出したりしないので地雷が爆発しても人間がけがをすることがない。これによって、地雷を効率良く、しかも安全に除去できる。

【0014】また、ノズル26から吹き出した空気及び吹き飛ばされた土砂をバケット13で受けることができ、空気や土砂が周囲に飛散することを防止できる。

【0015】また、ノズル26をバケット13から離れた姿勢とすれば、バケット13で地雷を掘り出す時にノズル26が邪魔にならない。

【0016】第4の発明は、走行体1を備えた車体4と、この車体4に第1の上下揺動機構15で上下揺動自在に取付けたバケット13と、このバケット13に取付けたノズル26と、このノズル26に空気を圧送する空気供給装置28で構成したことを特徴とする作業機械である。

【0017】第4の発明によれば、ノズル26で地表に空気を噴きつけて地表の土砂を吹き飛ばして土中の地雷を露出させ、その地雷をバケット13で掘り出して除去できるし、人間が直接土砂を吹き飛ばしたり、地雷を掘り出したりしないので地雷が爆発しても人間がけがをすることがない。これによって、地雷を効率良く、しかも安全に除去できる。

【0018】第5の発明は、第1ないし第3の発明において、前記ノズル26は、ノズル本体30と複数種類の噴出部31を備え、そのノズル本体30に1つの噴出部31を交替して取付け可能な形状で、1つの噴出部31は固体、流体が入れられた容器34が接続してある作業機械である。

【0019】第5の発明によれば、地面の形状などに応じて任意の噴出部31を備えたノズル26とすることができ、また、地雷が露出したら容器34を接続した噴出部31に交換すれば空気とともに固体、流体が噴出するので、地雷を爆発させることも可能である。

【0020】第6の発明は、第1ないし第3の発明において、ノズル26の先端部に弾性変形可能な上下一対のプレート35、38を取付けた作業機械である。

【0021】第6の発明によれば、ノズル26から噴出する空気ですり、38が振動するから、そのプ

レート34、38で地表を打撃して破砕できる。これによって、硬い地表の土砂を破砕して空気で吹き飛ばすことができる。

【0022】

【発明の実施の形態】左右の走行体1を備えた下部車体2と、この下部車体2に旋回自在に取付けた上部車体3で車体4としてある。上部車体3には運転室5が取付けられており、第1ブーム6が第1ブームシリンダ7で上下揺動自在に取付けてある。この第1ブーム6に第2ブーム8がシリンダ9で左右揺動自在に取付けてあり、この第2ブーム8に取付けたブラケット10にアーム11がアームシリンダ12で上下揺動自在に取付けてあり、そのアーム11にバケット13がバケットシリンダ14で上下揺動自在に取付けてある。つまり、バケット13が第1の上下揺動機構15で上下揺動自在に取付けてある。

【0023】前記上部車体3に補助ブーム20が補助ブームシリンダ21で上下揺動自在に取付けてあり、この補助ブーム20に補助アーム22が補助アームシリンダ23で上下揺動自在に取付けてある。この補助アーム22にノズル取付体24がシリンダ25で上下揺動自在に取付けてあり、このノズル取付体24にノズルが取付けられている。つまり、ノズル26が第2の上下揺動機構27で上下揺動自在に取付けてある。前記ノズル26には空気供給装置28から空気が圧送されて噴出する。

【0024】次に動作を説明する。図1に示すように、バケット13よりも車体側にノズル26を位置させ、ノズル26から空気を地面に噴出して土砂を吹き飛ばす。この吹き飛ばした土砂はバケット13に衝突して周囲に飛散しない。

【0025】前述の動作を行なうことで土中の地雷Aが地表に露出し、その露出した地雷Aをバケット13で掘り起して除去する。

【0026】次にノズル26の他の形態を説明する。図2に示すように、ノズル本体30と噴出部31でノズル26とし、ノズル本体30に突起32を設けると共に、噴出部31の基部に鉤形の溝33を形成し、この溝33を突起32に係脱することで噴出部31をノズル本体30に着脱自在とする。

【0027】噴出部31としては噴出開口部31aがラッパ型に拡張したもの、広口狭幅のものや、先端部を斜めに切詰したもの、固体又は液体を入れる容器34を接続したものなどであり、用途に応じて1つの噴出部31をノズル本体30に交替して取付ける。なお、容器34を接続した噴出部31を取付ければ、空気とともに容器34内の固体、液体が噴出するので、露出した地雷Aを爆発させることも可能である。

【0028】図3と図4に示すように、ノズル26の先端部上下にゴム又は布などにより薄板状となったプレート35をそれぞれ取付ける。このプレート35の長さは

幅の5～10倍程度である。

【0029】このようにすれば、ノズル26から噴出された空気でプレート35が上下方向に振動するから、硬い地面の土砂を解砕して吹き飛ばすことができる。

【0030】図5と図6に示すように、ノズル本体30に複数の噴出部31を取付けて噴出部31の全幅をバケット13の幅と略同一とする。また、ノズル本体30には調整ネジ36で作動するバルブ37を各噴出部31と対向してそれぞれ設け、各噴出部31から吹き出す空気の量を調整できるようにしてある。

【0031】このようにすれば、バケット13の幅と同一幅の土砂を一度に吹き飛ばすことができる。

【0032】図7と図8に示すように各噴出部31の上下にゴム製のプレート38をそれぞれ取付け、この各プレート38の先端部に表面に凹凸がある重り39をチェーン40で取付ける。

【0033】このようにすれば、吹き出したエアでプレート38が振動し、重り39が激しく任意方向に動くので、硬い地面を解砕してエアで吹き飛ばすことができる。

【0034】次に本発明の第2の実施の形態を説明する。図9に示すように、下部車体2に二重旋回サークル50で上部車体3と旋回台51を独立して旋回可能に取付ける。上部車体3にバケット13を第1の上下揺動機構15で上下揺動自在に取付ける。旋回台51にノズル26を第2の上下揺動機構27で上下揺動自在に取付け、この旋回台51に空気供給装置28を取付ける。

【0035】次に本発明の第3の実施の形態を説明する。図10に示すように、上部車体3にバケット13を第1の上下揺動機構15で上下揺動自在に取付ける。下部車体2に図示しないシリンダで上下揺動自在に取付けたブレード52にノズル26を第2の上下揺動機構27で上下揺動自在に取付けると共に、空気供給装置28を取付ける。

【0036】次に本発明の第4の実施の形態を説明する。図11に示すように、上部車体3にバケット13を第1の上下揺動機構15で上下揺動自在に取付ける。下部車体2に取付けたブラケット53にノズル26を第2の上下揺動機構27で上下揺動自在に取付けると共に、空気供給装置28を取付ける。

【0037】前述の第2、第3、第4の実施の形態によれば、バケット13の後方にノズル26を位置させて地表の土砂を吹き飛ばすことができるし、ノズル26単独で地表の土砂を吹き飛ばすことができる。

【0038】次に本発明の第5の実施の形態を説明する。図12に示すように、上部車体3にバケット13を第1の上下揺動機構15で上下揺動自在に取付ける。このアーム11の先端寄りにノズル26を上下揺動自在に取付け、ブーム6に取付けた空気供給装置28を取付け、ホース60でノズル26に空気を供給する。

【0039】図13に示すように、アーム11の孔61に筒体62を回転自在に嵌挿し、この筒体62の一端部にノズル26を一体的に取付ける。アーム11に固着した固定筒体63に前記筒体62の他端部を回転自在に挿入し、その固定筒体63に取付けた油圧モータ64で筒体62を回転する。固定筒体63にホース60を接続し、筒体62の開口部65から空気を圧送する。

【0040】アーム11を上方に揺動してノズル26をバケット13に向う姿勢として地面に対して斜めとすることで地表の土砂を吹き飛ばすことができる。ノズル26をアーム11と平行としてバケット13と離れた姿勢とすればバケット13で掘り起し作業できる。

【0041】次に本発明の第6の実施の形態を説明する。図14に示すように、上部車体3にバケット13を第1の上下揺動機構15で上下揺動自在に取付ける。このバケット13内にノズル26を図15に示すように取付け、第1ブーム6に空気供給装置28を取付けてホース60でノズル26に空気を圧送する。

【0042】なお、第2ないし第5の実施の形態に用いるノズル26は前述の各実施の形態に示したノズル26を用いることができる。

【図面の簡単な説明】

【図1】本発明の第1の実施の形態を示す斜視図である。

【図2】ノズルの他の形態を示す分解斜視図である。

【図3】ノズルの他の形態を示す斜視図である。

【図4】動作説明図である。

【図5】ノズルの他の形態とバケットを示す斜視図である。

【図6】ノズルからの噴出空気量の調整部分の断面図である。

【図7】ノズルの他の形態を示す斜視図である。

【図8】動作説明図である。

【図9】本発明の第2の実施の形態を示す側面図である。

【図10】本発明の第3の実施の形態を示す側面図である。

【図11】本発明の第4の実施の形態を示す側面図である。

【図12】本発明の第5の実施の形態を示す側面図である。

【図13】ノズル取付部の断面図である。

【図14】本発明の第6の実施の形態を示す斜視図である。

【図15】バケットの斜視図である。

【符号の説明】

1…走行体

2…下部車体

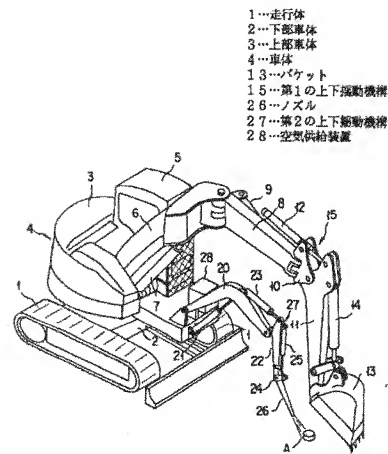
3…上部車体

4…車体

13…バケット  
15…第1の上下揺動機構  
26…ノズル  
27…第2の上下揺動機構  
28…空気供給装置  
30…ノズル本体  
31…噴出部  
34…容器  
35…プレート  
36…調整ネジ  
37…バルブ

38…プレート  
39…重り  
40…チェーン  
50…二重旋回サークル  
51…旋回台  
52…ブレード  
53…ブラケット  
60…ホース  
62…筒体  
63…固定筒体  
64…油圧モータ

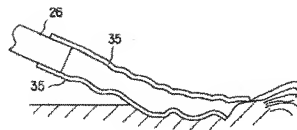
【図1】



本発明の第1の実施の形態を示す斜視図

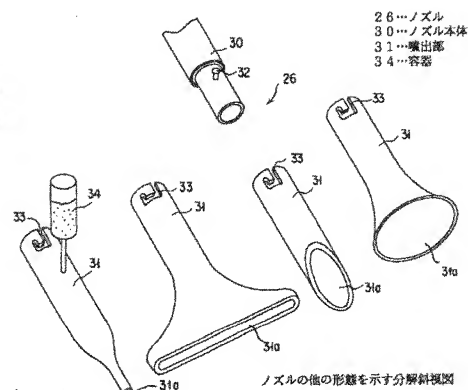
【図4】

26…ノズル  
35…プレート



動作説明図

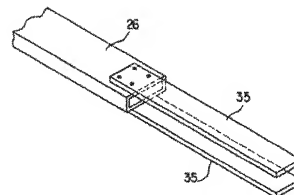
【図2】



ノズルの他の形態を示す分解斜視図

【図3】

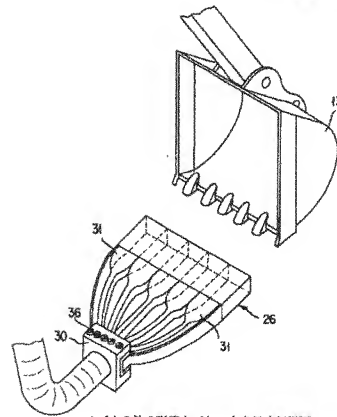
26…ノズル  
35…プレート



ノズルの他の形態を示す斜視図

【図5】

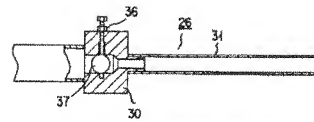
13…バケット  
26…ノズル  
30…ノズル本体  
31…噴出部  
36…調整ネジ



ノズルの他の形態とバケットを示す斜視図

【図6】

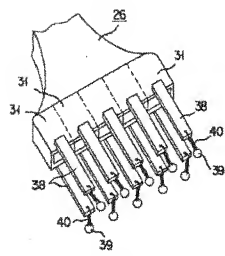
26…ノズル  
30…ノズル本体  
31…噴出部  
36…調整ネジ



ノズルからの噴出空気量の調整部分の断面図

【図7】

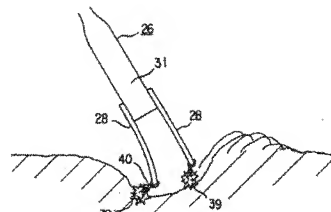
26…ノズル  
31…噴出部  
38…プレート  
39…重り  
40…チェーン



ノズルの他の形態を示す斜視図

【図8】

26…ノズル  
31…噴出部  
38…プレート  
39…重り  
40…チェーン



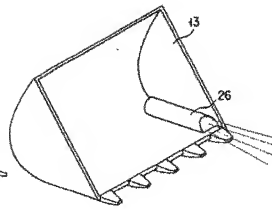
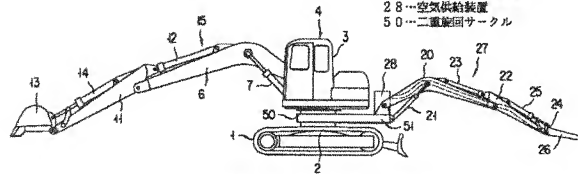
動作説明図

【図9】

【図15】

- 1…走行体  
2…下部車体  
3…上部車体  
4…車体  
13…バケット  
15…第1の上下揺動機構  
26…ノズル  
27…第2の上下揺動機構  
28…空気供給装置  
50…二重旋回サクル

- 13…バケット  
26…ノズル



本発明の第2の実施の形態を示す側面図

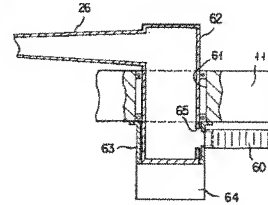
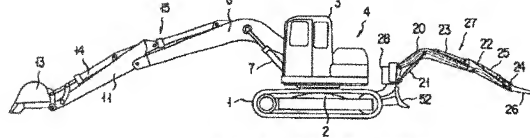
バケットの斜視図

【図10】

【図13】

- 1…走行体  
2…下部車体  
3…上部車体  
4…車体  
13…バケット  
15…第1の上下揺動機構  
26…ノズル  
27…第2の上下揺動機構  
28…空気供給装置  
52…ブレード

- 11…アーム  
26…ノズル  
60…ホース  
62…筒体  
63…固定筒体  
64…油圧モータ

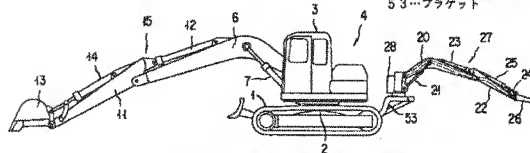


本発明の第3の実施の形態を示す側面図

ノズル取付部の断面図

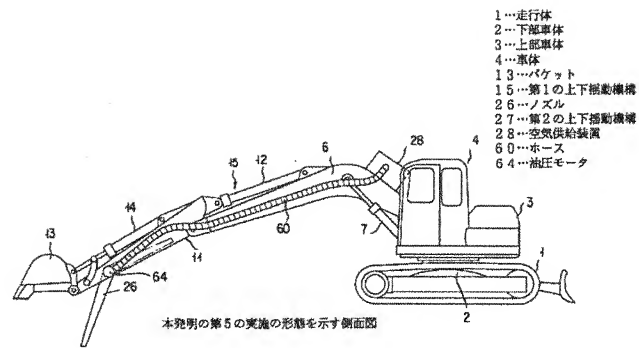
【図11】

- 1…走行体  
2…下部車体  
3…上部車体  
4…車体  
13…バケット  
15…第1の上下揺動機構  
26…ノズル  
27…第2の上下揺動機構  
28…空気供給装置  
53…ブラケット

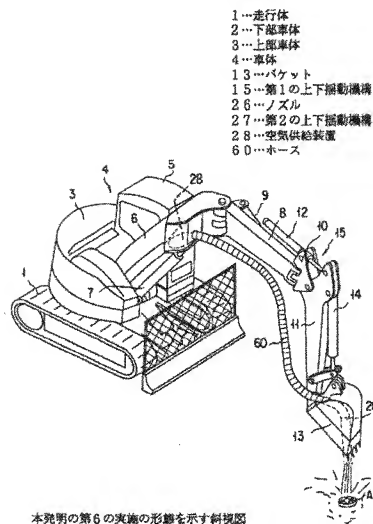


本発明の第4の実施の形態を示す側面図

【図12】



【図14】



フロントページの続き

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